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PATENT - TRADEMARK OFFICE

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5Nonprovisional Patent  
Serial No. 09/904,348  
Docket No. 9925/34713

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: PATRICK J. TOOMEY ) Group No.:  
Serial No.: 09/904,348 ) Examiner:  
Filed: 7/12/01 )  
Title: SYSTEM AND METHODS FOR )  
DETECTING FAULT IN )  
STRUCTURE )

RECEIVED

OCT 30 2001

Technology Center 2100

## PETITION TO MAKE SPECIAL

Commissioner of Patents & Trademarks  
Washington, DC 20231

Dear Sir or Madam:

This paper is submitted to request that the Commissioner confer special status on the above-identified patent application and grant advancement of the examination of this patent application pursuant to 37 C.F.R. 1.102 and M.P.E.P. §708.02.

The grounds for this petition are: (1) infringement of the claims by another under M.P.E.P. §708.02 II; and (2) the invention can be used to counter terrorism under M.P.E.P. §708.02 XI. Attached are the fees required under 37 C.F.R. §1.17(i).

The grounds under which advancement of this patent application for examination are requested, are addressed separately below.

## INFRINGEMENT

(a) There is an infringing system or method in use, as evidenced by the attached article. RECEIVED

FEB 27 2002

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## CERTIFICATE OF MAILING BY EXPRESS MAIL

I hereby certify under 37 C.F.R. §1.10 that this correspondence is being deposited with the United States Postal Service under Express Mail Label No. EL789902317US in an envelope addressed to: Commissioner for Patents, Washington, DC 20231, on October 12, 2001.

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Jon M. Jurgovan - Reg. No. - 34,633

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(b) A rigid comparison of the alleged infringing system or method with the claims of the application has been made, and, in my opinion, some of the claims are unquestionably infringed, such as Claims 1, 2, 9, and 22; and

(c) I have made or caused to be made a careful and thorough search of the prior art or have a good knowledge of the pertinent prior art. Copies of possible references deemed most closely related to the subject matter encompassed by the claims have been attached. The most closely related use appears to be in connection with measuring the condition of cables of a suspension bridge, highway sound barriers, and concrete and granite samples in a laboratory. The attached documents also indicate use of a laser vibrometer in connection with analysis of motors, brakes, turbochargers, DC motors, gear boxes, home appliances such as washing machines or vacuum cleaners, micro-devices, machines, aircraft, aerospace systems, turbines, pipes, pumps, medical prosthesis, and aerosols. None of these possible references disclose the use of a laser vibrometer to detect faults in a "structure" as defined in this patent application, such as a "building, house, townhouse, condominium, office complex, warehouse, or storage facility, for example" as defined at p. 10, l.4-5 of the patent application.

#### **DETAILED ANALYSIS - INFRINGEMENT**

Claim 1 of the above-identified patent application recites:

1. A method comprising the steps of:
  - a) optically sensing vibration from a structure; and
  - b) determining whether a fault exists in the structure, based on the vibration optically sensed in the step (a).

Attached as Exhibit A is an article from the Technology Section of The New York Times® Internet publication. The article is admissible in evidence under Federal Rule of Evidence (FRE) Rule 802(1) as it reflects the reporter Anne Eisenberg's present sense impression while perceiving the event at issue, i.e., the monitoring of Building 4 of the World Trade Center with a laser Doppler velocimeter. This article is self-authenticating under Federal Rule of Evidence (FRE) 902(6) because the article is a newspaper or periodical as provided under this Rule.

The article relates to the monitoring of Building 4 of the World Trade Center damaged in the terrorist attacks of September 11, 2001, to determine whether the building is

in danger of eminent collapse due to movement of heavy equipment in the vicinity of the building. The article states:

World Trade Center Building 4 still stands amid the devastation of the twin towers in Lower Manhattan. But the building, a smoke-blackened, nine-story structure at the corner of Liberty and Church streets, was heavily damaged in the Sept. 11 attacks, and vehicles hauling debris from the disaster site could trigger its collapse, endangering rescue workers.

To warn of such a danger, a scientist and his team are using a laser system to bounce beams off the building, taking readings every half-second that are precise enough to measure tiny shifts in the building's motion.

The article states that the instrument to measure the building's motion "laser Doppler velocimeter" to take measurements "...continuously and rapidly and show the actual movement of the building, no matter how slight."

The article further states:

The laser-based device used ... monitors the back-and-forth motion of the building, bouncing its laser beam off a spot about a third of the way up the façade. As the building moves toward the laser beam or away from it, the apparent frequency of the reflected light is altered slightly, just as a train whistle changes pitch as the train moves past a listener.

Although the vibrations so far have been limited, that may change as heavy equipment begins to clear debris closer to the building.

"These large cranes are grabbing pieces of metal and I-beams," Dr. Sabatier said. "As they pull on that load, it causes the building to vibrate," just as a tuning fork might vibrate when it is struck.

"By this close, constant, monitoring, we can let the engineers know immediately if there are any big changes in the frequency and amplitude of the oscillation," he said.

It is very clear from this article that a method of "optically sensing vibration from a structure" is being used on World Trade Center Building 4. For example, the article states that the "...laser device used ... monitors the back-and-forth motion of the building..." In addition, it is clear that the method used in the building is "determining whether a fault exists in the structure, based on the vibration optically sensed." For example, the article states that the optical sensing is being performed to warn of imminent collapse of the building. Since a building could not generally collapse without a fault existing in it, such as damage to the

structure's elements, it is apparent that the method of claim 1 is infringed by the method used to monitor World Trade Center Building 4.

Claim 2 of the above-identified application recites:

2. A method as claimed in claim 1 wherein the step (a) comprises substeps of:
  - a1) generating and transmitting a laser beam to the structure;
  - a2) receiving the laser beam from the structure;
  - a3) detecting Doppler shift in the received laser beam relative to the transmitted laser beam; and
  - a4) determining at least one of the peak displacement and velocity of the vibration, based on the detecting of the substep (a3).

In the article, a laser Doppler velocimeter is used to bounce a laser beam off a spot of the façade of World Trade Center Building 4. Accordingly, the method and system used to monitor the World Trade Center is "generating and transmitting a laser beam to the structure" and "receiving the laser beam from the structure." In addition, the article states "As the building moves toward the laser beam or away from it, the apparent frequency of the reflected light is altered slightly, just as a train whistle changes pitch as the train moves past a listener." Hence, the method used on World Trade Center Building 4 "detecting Doppler shift in the received laser beam relative to the transmitted laser beam." The article further states that the Doppler laser velocimeter is "showing a movement of about 100 microns" as the building vibrates and is monitoring to determine if "there are any big changes in the frequency or amplitude of the oscillation." Hence, the method used on World Trade Center Building 4 is "determining at least one of the peak displacement and velocity of the vibration, based on the detecting."

Claim 9 of the above-identified application recites:

9. A method as claimed in claim 1 wherein the step (a) is performed with a Doppler laser vibrometer.

The device used to monitor the World Trade Center Building 4 is a Doppler laser velocimeter. The term Doppler laser vibrometer is broad enough to cover laser Doppler velocimeter within its meaning. Accordingly, it is submitted that Claim 9 is infringed by the monitoring of World Trade Center Building 4, in addition to Claims 1 and 2.

Claim 22 recites:

22. A method as claimed in claim 1 wherein the structure is a building.

Clearly, World Trade Center Building 4 is a building. Accordingly, it is submitted that this patent application should be made special on this basis.

### **COUNTERING TERRORISM**

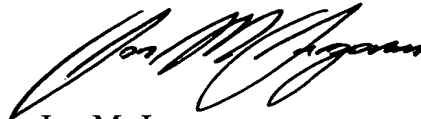
As indicated in the attached article, the invented system and method can be used to monitor the stability of buildings damaged by terrorist acts like those of September 11, 2001. This can be used to enhance safety of rescue and recovery personnel working near a building damaged by terrorist attack. For this reason, it is submitted that the claimed technology has significant value in countering terrorism.

If there are any questions in connection with this petition, kindly contact the undersigned at the telephone number given below.

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Respectfully submitted,

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